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FOREST INSECT LABORATORY,
STANFORD UNIVERSITY CALIFORNIA.

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Klamath?
Patterson ?
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JENNY CREEK AREA.

BEAVER CREEK AND JENNY CREEK UNITS.

PACIFIC SLOPE STATION.

Insect history of the Area previous to 1914.

Depredations by *Dendroctonus* beetles have resulted in fairly heavy losses of merchantable timber on this area for a number of years past.

Extensive holdings by the Weyerhaeuser Lumber Company and the A.C.Hopkins Company comprise the greater portion of the well timbered sections; a good portion of the odd sections come under the O and C grant lands. Practically the entire area is under the administration of the State (Oregon) Fire Association.

During the seasons of 1913 the area comprising the Jenny Creek Unit was put under insect control with the usual methods by the representatives of this Association under the supervision of Mr. J.F. Kimball, Secretary of the Klamath and Lake Counties Division. Personal advice and assistance was ably rendered by a representative of the Bureau of Entomology, Mr. W.M. Glendinning. Data etc. of the control of this area are not available to this Station at this time. Mr. Kimball states in his annual report (1915) to the Association that there is hardly to be found one tree which has been attacked by bark beetles subsequent to the control operations.

This is not in line with conditions as the writer found them. During the summer of 1915 the writer traversed this section a number of times and at that time noted a good number of dying trees affected with the bark beetles, proving that the insects were present subsequent to the control operations. This report bears this out fully and shows that the infestation is again becoming aggressive.

Period of Examination. (1).

This area was covered by a general reconnaissance from the higher points and traverse lines thru the level portions, where the stand of timber is heavy. In general the infestation was estimated by counting the number of "Red Top" trees by the use of field glasses, allowing 50% for error. (additional). Section 6, Township 40 S, Range 4 E., Willamette Mer. was intensely cruised and all trees examined and marked. Sections 3, 15 and 22, Township 40 S, Range 4 E., Willamette Mer. were well covered and infested trees examined. As these sections represent the average infestation the data obtained may be applied to the area in general.

Reconnaissance and cruise by John E. Patterson, Aug 31, and Sept 1, 2, 3, 4, 1916. Compilation by John E. Patterson.

Location of the Area. (2).

Location of the Area. (2).

The area comprises in general; the watershed of: Keene Creek, Little and Big Beaver Creeks, Chinquapin Creek and a part of Jenny Creek. It includes Township 40 S, Range 4 E., and parts of Townships 39 S, Range 3 and 4 E., and Township 40 S, Range 4 E., Willamette Mer. It is bounded on the north by the main crest of the Cascade Range and Big Beaver Creek; on the east by a high ridge of the Cascade Mts; on the south by the bluffs of the Klamath River Canyon; on the west by the main crest of the Cascade Range. Approximate area 90 square miles.. The area is divided into two Units as previous control operations in the eastern portion would warrant this. The portion of the area east of Jenny Creek is called the Jenny Creek Unit. That portion west of this creek is the Beaver Creek Unit.

General Topography. (3).

Gentle slopes of south and west exposures to steep slopes of rocky formation, with deep canyons along the streams. Elevations ranging from 5000 to 6500 feet with the Yellow pine infestation averaging about 4000 feet.

Character and Stand of Timber. (4).

Excellent stand of mixed, Yellow and Sugar pine, Douglas fir and some White fir. The pines and Douglas fir pinch out at elevation of about 5500 feet. In the dense stand on the gentler slopes the forest floor is free from brush. On the higher elevations and where the stand has been thinned thru fire or other agencies the chaparral is very dense and almost impenetrable. On the exposed situations, such as points of spurs and canyon walls, the stand is lighter and of less vigorous growth. Probably 70% of the stand over the entire area is mature and past.

Species of Trees Affected. (5).

<u>Yellow pine.</u>	By far the greater percentage.	
	85.4% of number of trees.	84.% of volume.
<u>Sugar pine.</u>	3.4% " " " "	10.% " "
<u>Douglas fir.</u>	3.4% " " " "	8.8% " "
<u>White fir.</u>	6.6% " " " "	.7% " "

Species of Insects Involved in Primary Attack. (6).

In Yellow pine.

<u>Dendroctonus brevicornis.</u>	98.% of No. of trees.
<u>Melanophila gentilis.</u>	2.% " " " "

In Sugar pine.

<u>Dendroctonus monticolae.</u>	100.% of No. of trees.
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Infested trees examined and marked on Section 6, Twp. ~~40~~⁴⁵ S., Range 4 E,
Willamette Mer. Sept 2 - 3, 1916.

<i>Pinus ponderosa.</i>	Tree No.	D.B.H. (inches)	Height (feet).
	2	40	130
1914 generations.	58	48	130
<i>Dendroctonus brevicornis.</i>	10	30	100
Insects have abandoned	11	24	100
the trees, the bark in	17	36	100
most cases is loose	18	30	110
and the sap-wood is	27	18	40
discolored. Foliage is	28	24	80
black.	29	18	50
	30	16	50
	32	30	110
	35	16	50
	39	20	80
	40	20	80
	41	20	80
	42	20	80
Totals	16	410	1370
Average		25.6	85.6
Volume, Board Feet. (Scribner Rule).			13,630

<i>Pinus ponderosa.</i>	1	24	90
	4	8	50
1915-2 generation.	5	24	100
<i>Dendroctonus brevicornis.</i>	6	30	110
	9	20	80
Beetles have emerged from	12	24	50
these trees. In some trees	15	24	80
secondary insects, (<i>Elonium</i>	16	24	80
<i>longum</i> and <i>Melanophila gen-</i>	19	30	110
<i>talis</i>), are present. Foliage	23	36	110
is: sorrel top and red top.	24	20	80
In a few trees only the	31	24	100
foliage is fading from normal	33	24	90
green.	34	32	110
	36	30	60
	38	20	100
Totals	16	394	1410
Average		24.6	88
Volume, Board Feet. (Scribner Rule).			10,345

Infested trees examined and marked on Section 6, Twp. ¹⁷/₃₀ S., Range 4 E.,
Willamette Mer. Sept 2-3, 1916.

<i>Pinus ponderosa.</i>	Tree No.	D.B.H. (inches).	Height (feet).
1916-1 generation.	7	20	80
<i>Dendroctonus brevicornis.</i>	27	32	120
Totals	2	52	200
The broods of this generation are in the full grown Average.		26	100
larvae, pupae and new adult stage. The bark is tight and sap-wood is only slightly discolored. Foliage is fading to serrel.			
		Volume, B.F. (Scribner Rule)	1,740

<i>Pinus ponderosa.</i>			
1916-2 generation.	8	60	120
<i>Dendroctonus brevicornis.</i>	13	24	120
	14	28	120
Parent adults attacking and extending galleries and depositing eggs.	26	20	80
	26	18	70
Totals	5	150	510
In the main the attacked trees are thrifty, the foliage is normal green, pitch tubes prominent on the surface of the bark.			
Averages		30	102
		Volume, B.F. (Scribner Rule)	7,110

<i>Abies concolor.</i>			
1915 attack.	20	20	70
<i>Scolytus subscaber.</i>	21	20	60
Totals	2	40	130
Brood in the larval and pupal stage.			
Foliage red.		20	65
		Volume, B.F. (Scribner Rule)	.484

Infested trees examined and marked on Section 6, Twp. ⁴⁶ 38 S., Range 4 E.,
Willamette Mer. Sept 2-3, 1916.

Pseudotsuga taxifolia.

1915 attack.	Tree No.	D.B.H. (inches)	Height (feet).
<i>Hylesinus nebulosis.</i>	22	26	100
Brood: Pupae and new adults.	Volume, B.F. (Scribner Rule). .700		
Foliage red.			

Pinus ponderosa.

1915 attack.	43	18	50
<i>Melanophila gentilis.</i>	Volume, B.F. (Scribner Rule). .100		
Brood in the pupal- larval stage.			
Foliage fading.			

Note: In the above tables the following secondary insects are present:
Dendroctonus valens, in trees Nos. 8, 31, 37; *Melanophila gentilis*, in
trees Nos. 5, 23, 24, 27, 31, 33, 34, 39, 40, 41, 42; *Elmionium longum*,
in trees Nos. 1, 4, 5, 16, 19; *Acanthosenia spectabilis*, in tree No. 36.

Predators: Clerid larvae was found in trees Nos. 36, 37, 38. Woodpecker
work is very light; only a few trees on this section showed evidence of
their work.

Infested trees examined on Sections 3, 22, 27, Twp. 40 s, Range 4 E,
 Willamette Mer. Aug 31, 1916.

Pinus ponderosa.

Dendroctonus brevicornis.

	Generations				
	1914 -	1915-2	1916-1	1916-2	Before 1914.
No. of trees	5	6	1	1	There are a
Aver. Diameter	32	37	30	30	number of
Aver. Height	128	110	90	120	"Ghost" trees
Volume B.F.	8,150	10,320	930	1,290	on these secs.
					showing that
					the beetles
					have been active
					here for some ti
					time.

Pinus lambertiana.

Dendroctonus monticolus.

No. of trees	-	1	4	1	4
Aver. Diameter		48		48	36
Aver. Height		130		130	120
Volume B.F.		3,190		3,190	6,080

Pseudotsuga taxifolia.

Dendroctonus pseudotsugae.

No. of trees	1	2	-	-	6
Aver. Diameter	28	31			30
Aver. Height	100	110			110
Volume B.F.	700	2,000			5,820

Note. The old infestation, "Ghost Trees", and trees attacked previous to 1914 no doubt were present at the time of the control operations and therefore would bear no relation to the present infestation.

In Douglas fir.

Dendroctonus pseudotsugae. 76. % of No. of trees.
Hylesinus nebulosus. 25. % " " " "

In White fir.

Scolytus subcaper. 100. % of No. of trees.

Past Infestation, Abandoned Trees. (7).

On the Jenny Creek Unit:

Past infestation (previous to 1914) has been heavy as evidenced by the number of ghost trees, these probably average 20 trees per section. These trees indicating past infestation were no doubt killed previous to, and were present, at the time of the control operations and would therefore bear no direct relation to the present infestation.

On the Beaver Creek Unit:

Past infestation on this Unit, figured from the number of ghost trees present, was not so heavy as on the other unit. Old abandoned trees do not exceed 12 trees per section; this would indicate that the present infestation has increased since 1913.

Present Infestation. (8).

In Yellow pine.

Dendroctonus brevicornis.

	No. of trees. (count)	No. of trees. (estimated)	Average Diameter.	Aver. Height.	Volume B.F.
1914 genrs.	200	400	25	90	236,000
1915-2 genr.	280	460	27	100	377,200

Melanophila gentilis.

1915 genrs.	-	40	18	50	4,000
Totals	480	900			617,200

In Sugar pine.

Dendroctonus monticolae.

1915 genr.	-	100	40	120	19,300
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Respectfully submitted,

Sept 6, 1916.

John E. Pattison
 Entomological Ranger.